FIRE STATION CONSTRUCTION: TO BUILD OR TO BUY!

Executive Development

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Abstract

The problem was that no information existed to identify the options available to the City of Staunton for building or buying a facility to be used as an additional fire station. The purpose of this research project was to provide information that identifies the options available to the City of Staunton for building or buying a facility to be used as an additional fire station. This study used a descriptive research methodology. The research questions were:

1. What factors need to be identified for comparing the different options available?
2. What advantages/disadvantages are realized when building a new fire station using traditional construction methods?
3. What advantages/disadvantages are realized when building a new fire station using a modular construction concept?
4. What advantages/disadvantages are realized when buying a current building and making the necessary renovations to produce a working fire station?

The procedures involved gathering information from written texts, journals and online sources and conducting interviews with subject matter experts. The results were that new construction methods have clear and distinct advantages when analyzing long term financial impacts. Modular construction can be built in a shorter time frame and for less total money, however the cost savings over a period of twenty years does not appear to be significant. Renovated buildings incur higher utility and maintenance costs due to life expectancies of major

operating systems within the building and the lack of energy efficient components. Over a period of twenty years or greater, a renovation effort may actually cost more than opting to build a newly constructed fire station initially.

It is recommended that further research be performed addressing the use of modular construction by the fire service. Also, information is not available concerning the purchase and reuse/ renovation of structures not originally constructed for use as a fire station facility. Project managers are encouraged to consider local economic conditions and affordability with the options addressed in this study before making a recommendation to elected officials.

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Introduction

The problem is that no information exists to identify the options available to the City of Staunton for building or buying a facility to be used as an additional fire station. The purpose of this research project is to provide information that identifies the options available to the City of Staunton for building or buying a facility to be used as a fire station. This study uses a descriptive research methodology. The research questions are:

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Background and Significance

The background of the applied research project began during the analysis of operational response data published in a report provided to City management on August 10, 2001 (City of Staunton, 2001). Prior to this report justifying and defining the need for resources to be redeployed, the City of Staunton hired Mr. C. Robert Stripling, in November 2000, as City Manager. After several months of orientation, he required specific response data to be generated to measure

performance objectives on both a quarterly and an annual basis. This information gathering coupled with the affirmative vote on NFPA 1710 in May of 2001, persuaded management to look very closely at the current level of resources and overall effectiveness of the emergency service delivery system. A detailed study was performed in August of 2001 comparing response times to objectives, measuring travel distances, analyzing all information and finally, recommending an additional facility appropriately located. Both management and the elected officials have been convinced by this report and other studies, that an additional facility is needed and a general area identified for the location has been determined. The information necessary to proceed forward is addressed by this study.

This applied research project is important to this community because it is the next logical step in the acquisition process of an additional fire station that will provide emergency services to the community. The justification process and location issues have been completed to the satisfaction of management and the elected officials. The concerns at this point in time to all interested parties have been identified by the question: “Do we build a new facility, or buy and renovate an existing structure?” Other questions have arisen addressing the options, costs, timelines, building life and other needed information. This project addresses most of the concerns and questions of the elected officials. With this information, they can make an informed decision concerning the needed facility so that the citizens can realize a better service level.

This project has significance to the Executive Fire Officer Program (EFOP), since the information contained herein may assist future Fire Officers in the decision to buy or build when additional facilities are needed in their communities. The specific link to the Executive Development (R123) curriculum is satisfied in the areas of: Team-building, problem-solving and writing research reports (U.S Fire Administration, Executive development, 2003 Catalog, p.29). The significance to the National Fire Academy and the United States Fire Administration is that the results of this study will produce an additional facility to this community and satisfy several of the USFA operational objectives. Specifically, this redeployment of resources should reduce the loss of life from fire by 15 percent for all three listed categories by the physical location of the local emergency responders (U.S Fire Administration, Operational objectives, 2003 Catalog). Also, the quicker response times across the City will help us deal with emergent issues in a timely manner.

Literature Review

The critical findings that added to this project came from mainly five (5) sources. The most significant contribution came from a monthly, published valuation service called Marshall and Swift. This service is used primarily by City and County Assessors, along with Engineers in the building industry to calculate current construction costs, building life, depreciation rates and a host of other very useful tables and charts that a project manager (or department head) would be well-served to review prior to initiating any type of cost estimates. Marshall

and Swift is a subscriber-based service that is updated monthly with market-fluctuations. This information provides financial estimates and valuations of building life, construction types, and depreciation that are no more than 30 days dated at any given time (J. Gallaher, personal communication, May 22, 2002).

The second source of information came by way of personal interviews. A local banker provided interest rates and monthly amortization schedules to compare the difference construction options that is found in Appendix- A (A. Sweet, personal communication, June 14, 2002). The City's Director of Finance provided critical information on bond availability, rates, depreciation schedules and funding options (J. Colvin, personal communication, May 30, 2002). The City Assessor introduced the valuation services used and explained the local cost-multipliers and the various critical charts and graphs (Gallaher, 2002). The City Manager provided guidance on what information needed to be identified for the elected officials to adequately compare and contrast the various construction and renovation options (C.R. Stripling, personal communication, May 09, 2002). When going into a project of this magnitude, these sources were extremely valuable.

The third source of information came from previous Executive Fire Officer papers submitted on similar subjects found through research in the Learning Resource Center (LRC) at the National Fire Academy. The most useful was a 1990 paper concerning the planning of a small community fire station (Campbell, 1990). It focused primarily on renovating a current fire station which was of little use in this project; however, the author did offer some very useful information

concerning the planning of the physical layout of the structure and items that often get overlooked. This was practical information in analyzing current constructed building in our City and projecting their usefulness in renovation efforts towards this project. It also would be a good article to review prior to the design phase of new construction.

The fourth source comes from periodicals specific to the Fire Service. The most recent article that had some applicability dated back to 1990 in the form of a "wish-list" of 13 Fire Chiefs when planning for a new facility (Walsh, 1990). There were two articles dating back to 1978 and 1979 discussing the advantages of modular construction, but nothing current on the subject specific to this report. The most useful periodical was the online version of Fire Chief Magazine and it's series of articles entitled "StationStyle" which focused on award-winning facilities from across the nation (Career Gold Medalist, 2002). This series provided pictures, blueprints, success stories of new construction, costs, time-lines and an overview from the project managers which helps in determining the "trends" and "national-standards" when presenting and discussing options to elected officials.

The fifth source came from a text entitled "Safety and Health Considerations for the Design of Fire and Emergency Medical Services Stations" supplied upon request from the Publication Center at the National Fire Academy in Emmitsburg, Maryland (U.S. Fire Administration, 1997). This text offers a wealth of knowledge when designing a new facility. It also helps in the evaluation of existing facilities when analyzing their usefulness as a Fire Station. The text outlines both interior and exterior needs and identifies the health and

safety issues as they relate to past fire service data and current Federal and State laws (specifically OSHA requirements). This text should be considered a must read for anyone involved in the planning process of a fire station facility.

Procedures

The three most critical steps in adding additional facilities to a jurisdiction are: justification of the need for resources, determining the location, then designing the needed facility (Stripling, 2002). This was true for the City of Staunton where the justification process alone encompassed four City Council sessions and more than a dozen reports over a period of 18 months. With the justification approved and approximate location determined, many new questions arose concerning the project. Costs, time-lines, construction comparisons, and impact information needed to be prepared for further discussion and resolution. The determination had to be made: Who needed information and what specific information was needed to bring the facility on-line?

There were three groups with direct informational needs and several others with indirect needs. These major groups needing the information were: the elected officials, city management and the fire department. The minor groups consisted of neighborhood watch organizations, media interests, other departments within the city (Public Works, Engineering, Planning and Zoning, etc.), and other special interest groups (churches, businesses, Chamber of Commerce, etc.). For the purposes of this study, information was prepared for the top three groups having direct interests after soliciting their individual needs.

When requested by city management, each City Council member provided feedback as to what they “needed to know” in order to move forward with the project. The results were consistent with cost and affordability being most critical followed closely by value and public perception of quality. City management also required initial cost comparisons between construction types and a list formulated of existing structures that could be adapted through renovation to meet the needs of the project (Stripling 2002). Included in this needs summary was a break-down of start up costs versus recurrent costs in an amortization schedule (see the cost comparison appendix- A). Fire Administration desired much the same information previously mentioned with comparisons of completion time (service delivery), and functionality addressed.

With the solicitation of these groups having been completed, it was immediately apparent that each group had much the same informational needs with a few minor differences. Each wanted to be shown a comparison between a newly constructed block-and brick building versus a modular-type and be able to contrast these new construction types with an existing building lending itself to renovation. This is the foundation for the questions addressed in this study. Within each question, the groups wanted advantages and disadvantages listed in a general sense.

The costs (both initial and recurrent) are identified within the results section of this study as well as the concepts of value, functionality, affordability and quality. These terms were also a common request made by the direct interest groups when comparing the various types of construction versus the

renovation. Once the informational needs were defined, the procedures were systematically followed.

The LRC was canvassed in search of applicable published material as noted in the Literature Review. Online resources offered a great deal of information through the StationStyle series published by Fire Chief magazine online using fire station construction as a keyword (Career, 2002). Personal interviews with appropriate department heads and local banking officials also yielded some excellent verbal guidance and direction along with referrals to valuation services noting the most up-to-date information available on the market today.

Limitations

Through this mainly descriptive research methodology, this project relied more on the personal interviews than on the written and published text due to the lack of information available. There appears to be a copious amount of current information available when considering and planning to build a new fire station facility from the “ground-up”. When comparing difference types of construction used within the Fire Service for the actual building themselves, no information is available. The most recent article concerning modular construction dates back more than 22 years (Fire Chief, 1979, October). Many articles have been written concerning renovating current fire stations but none exist concerning renovating building used for other purposes for use a fire station. Specifically, what type of building is most adaptable to renovate (restaurants, warehouses, supermarkets,

retail businesses, etc.). This project was limited by the lack of information concerning two of the three components (modular construction and possible renovations). Some terms also need to be defined for the reader to understand the content of this report. The definitions below are not intended to be quotations cited from dictionary sources, but rather terminology as it applies and is utilized in this study.

Definition of terms:

National Fire Academy (NFA)	National educational facility campus located in Emmitsburg, Maryland in conjunction with the Emergency Management Institute (EMI)
LRC	Learning Resource Center located on the campus of the National Fire Academy that functions as a National Library specializing in Fire and Emergency service material.
OSHA	Occupational Safety and Health Administration
Initial Cost	Financial amount needed in the first year of operation including facility, contents and all start-up fees (architect, site preparation, etc.)

Recurrent Cost	Financial amount needed for subsequent years starting in year #2 and reoccurring each year until project is complete. Usually consists of bond debt, (Principal and interest on a mortgage loan) but may include maintenance and larger equipment that is leased.
Value	Perception of worth in relationship to investment. May be measured qualitatively in satisfaction or functionality, or quantitatively in building life versus total investment.
Depreciation	A quantitative method that represents the useful service life of a physical object.
Amortization	A quantitative calculation representing number of years of a loan versus the useful service life in relationship to outstanding debt.
Traditional Construction	Engineered method for building a physical facility using elements that include block, brick, steel, multi-zoned heating and cooling systems, fully equipped kitchen and bathroom facilities, adequate plumbing and peripheral

	storage and use areas that are highly functional.
Modular Construction	Pre-Engineered method for building a physical facility using elements that include sandwiched panels, area heating and cooling systems, kitchen and bathroom facilities, adequate plumbing and use areas that are moderately functional. Components are largely assembled off-site and attached after the majority of fabrication is complete.
Renovation	The acquisition of an existing facility that has been previously occupied by a business other than a municipal entity that lends itself to purchase and modifications necessary to be utilized as a functional fire station.
CIP	Capital Improvement Program. Facility or project needing more than $50,000 of funding. Threshold amount varies between jurisdictions.

Results

Before the research questions could be logically and systematically answered, two distinct groups required information that had to interpreted and blended together so that the final report would satisfy all “stockholder” needs: First, the project manager needs to identify the information requested from the elected officials; then management and administrative information must be obtained so that all vested parties have sufficient data to reach consensus in spending taxpayer monies. Although the list of “informational needs” can be quite extensive, this blending of basic information was necessary to address each research question adequately.

The factors identified for comparing and contrasting the three types of options available are: Cost, Value and Affordability. Along with these concepts, which can be both quantitatively and qualitatively measured, specific advantages and disadvantages for each unique construction type were requested by management (Stripling, 2002). A comprehensive overview of these factors are given in Appendixes A and B respectively.

The simple question of “How much is this going to cost?” is not so simple. The concept of cost can be further broken down and defined in several sub-categories. For purposes of this study, cost is defined in six views for comparison. They are: initial cost, recurrent cost, total cost for first 10 years, total cost for first 20 years, facility life expectancy and facility worth. Each construction type will have these separate components answered in detail below.

Building a newly constructed facility, using quality products and basing the estimates on a local determination of need of 8000 square feet, the project cost would be approximately $1,059,440. This amount is based on using Class-C construction and quoting $132.43 per square foot from the Marshall and Swift Valuation Service (2001, November, Section 15, p. 29). The square footage is consistent within the top 5 fire station award-winning designs with prices ranging from $134.95 to $175.35 per square foot. With a local modifier of 1.00 listed as current information in May 2002, the quote of $132.43 per square foot in Staunton, Virginia should be considered accurate (Marshall and Swift, 2002, section 99, p. 3). According to the superintendent of Public Works for the City of Staunton, initial costs should be calculated as approximately 10% of total project costs for new construction to accommodate site preparation, water and sewer connections, electrical and other utility fees, permits and other non-structural elements (Powell T., personal communication, June 3, 2002). The remainder of the project costs are usually financed over 30 years through incurring bond debt depending on facility life expectancy (Colvin, 2002).

Initial cost for modular construction is calculated the same way from the reference sources above. Modular construction is considered in the Class-S category and costs approximately $89.03 per square foot (Marshall and Swift, 2002, section 99, p. 3). A lack of data exists in comparing to other fire station projects nation-wide to realize whether this cost per square foot is “common” within the trade for this specific purpose, however, Modular construction has proven commercial applications in most communities. This type of building uses

less quality components that are generally prefabricated off-site. Building an S-Type building using the estimates on a local determination of need of 8000 square feet, the project cost would be approximately $712,240. Again, with a local modifier of 1.00 listed as current information, the quote of $89.03 per square foot in Staunton, Virginia should be considered accurate (Marshall and Swift, 2002, section 99, p. 3). Initial costs should be calculated the same as new construction with approximately 10% of total project costs identified to accommodate site preparation, water and sewer connections, electrical and other utility fees, permits and other non-structural elements (Powell, 2002). The remainder of the project costs are usually financed over 20-25 years through incurring bond debt depending on the specific building since the overall service life is less than in new construction (Colvin, 2002).

Initial Cost for buying an existing building and performing the necessary renovation can vary greatly. The City of Staunton chose to analyze all potential commercial buildings within the selected corridor in terms of functionality and practical use. Preference was given to vacant structures due to the elected officials desires for urban redevelopment. The initial list of 62 potential occupancies were scrutinized and pared down to two recommendations for purchase in a confidential report prepared for the specific purpose of acquisition (City of Staunton, 2002). The top recommendation is an existing warehouse with 2 Bay doors and 7700 square feet of useable space. The purchase price is $210,000 and renovation estimates for conversion to a fully functional fire station

by a local expert are quoted at an additional $200,000 (Powell, 2002). This brings the total project cost in year 1 to $410,000.

Recurrent Costs on new construction include debt service, monthly maintenance fees, and utility fees. On the proposed facility mentioned above, the recurrent cost would be $105,022.56 annually. This figure represents bond debt based on the constructed amount at 6% interest equaling a payment of $6,351.88 monthly (Sweet, 2002), added to approximately $2400 each month for utilities and maintenance. The City of Staunton has several buildings in the 8000-10,000 square foot range from which to draw comparison utility and maintenance cost data (Powell, 2002).

Recurrent Costs on modular construction include debt service and monthly maintenance and utility fees. On the proposed Class-S facility, the recurrent cost would be $90,032 annually. This figure represents bond debt based on the constructed amount at 6% interest equaling a payment of $5,102.71 monthly (Sweet, 2002), added to approximately $2400 each month for utilities and maintenance. Maintenance costs are very similar in the first 20 years, according to Powell, but a facility manager has to expect the costs to rise for modular construction after that time period due to the lower quality of building materials (Powell, 2002).

Recurrent costs on a purchase/renovation facilities do not have bond debt, however, the maintenance and utility costs are much greater than with new construction (Powell, 2002). This is due in part to the lack of energy efficient systems (heating, A/C, windows, etc.) and the service life-span already realized

by some or all of the major components that are expected to fail. Powell states that his experience is that any building more than 20 years old costs almost double it's newly constructed counterpart. His best estimation is that the recommendation selected would cost approximately $4800 per month in utilities and maintenance needed.

Total costs for the first 10 years of operation on Class-C (new) construction require a commitment of $1,156,170. This is calculated by adding the recurrent costs to initial costs as represented in the cost comparison appendix. Similarly calculated, the 20-year costs equates to $2,206,395 for new construction (Sweet, 2002). Modular construction costs for the first 10 years requires a commitment of $990,357 and the 20 year costs are calculated at $1,871,874 based on the same methodology listed above. A renovated building's 10- year costs are also the sum of initial cost plus recurrent cost, remembering that there are no bond debt requirements annually. The renovation facility recommendation has a 10- year cost of $986,000 and a 20 year cost of $1,562,000.

According to Marshall and Swift, building life expectancy for Class-C construction after 20 years of operation is 25 years remaining (Marshall and Swift, 2001, March, Section 97, page 16). Using the same reference source, modular construction after 20 years has a 15-year service life remaining. The current renovation of an existing 30-year old building with an additional 20-year service requirement leaves no expected building life remaining. This is based on original construction type and cross-referenced using the valuation tables from

Marshall and Swift. This fact has relative significance due to the realization that the 20-year threshold will produce the need to renovate again or most likely replace the building in it's entirety (It will be 50 years old).

Facility worth in dollars, after 20 years of useful service, is based on a depreciation rate of 23% for new construction and represents a building worth of $815, 769. This is derived from the initial building cost multiplied by the standard accepted depreciate schedule (Marshall and Swift, 2001, March, Section 97, page 16). Modular buildings incur 39% depreciation at the 20-year point making the building worth approximately $434,466. A current 30- year old building with an additional 20 years of service life incurs the maximum 79% depreciation leaving a building worth of $32,550. Care must be taken to focus on building worth in terms of a depreciated financial value versus the concept of fair market value. Each of these buildings true financial worth at the end of 20 years will depend on the market and the economy at that point in time. According to City Assessor Jim Gallaher, he would use the above given figures for comparison purposes realizing the market 20 years from now would effect all three types of project about the same way, thus, the numbers may change but the ratios would most likely be consistent (Gallaher, 2002).

The concept of Value is divided into 4 sub-categories. They are: total expected service life in a realistic sense, compliance to NFPA Standards, Compliant to OSHA Standards and community satisfaction.

In terms of Value, the realistic life-span of a facility is based primarily on the construction materials used and the method by which they are constructed.

According to Powell, the realistic life span of a block, brick and steel building is approximately 60 years. He stated that he realized that a 45 year limit is placed on these buildings by the valuation services, however realistically they were considered 60 year buildings. Modular buildings were realistically 40 year buildings due to the construction materials and the building proposed for renovation would have no more than 20 years of practical service life remaining. Powell stated this was the general accepted practice in the building industry, but no collaborating evidence was given to substantiate this claim.

In new construction, the planning process identifies compliance issues as they relate to building and fire codes and also provides guidelines for applicable NFPA recommendations and OSHA standards (U.S. Fire Administration, 1997). The very nature of constructing a facility from concept to completion lends itself well to identifying the unique qualities needed in a facility used for Fire and Emergency services. This is also consistent for modular construction. Renovation projects pose a completely new set of issues when comparing between the construction options. According to the local building official, the fact that the building in question is being used, (or has been used), for a different type of occupancy in the past may require a change in use-group or zoning ordinances when renovating for use as a fire station (J. Glover, personal communication, June 3, 2002). Building codes and fire codes have dramatically changed in 30 years as well as the applicability to the Americans with Disabilities Act (ADA), according to Glover. He recommends a thorough study be performed in any building recommended for change-of-use and assisted in analyzing the

specific renovation property proposal. Since this building is a “Butler-Style” metal-frame warehouse, all interior walls could be constructed to comply with ADA and OSHA requirements. After reviewing the overall renovation Plan with the Superintendent of Public Works, he concurred with the cost estimates and stated that compliance issues could be satisfied within the terms of the project (Glover, 2002).

Another concept of Value is in relation to community perception. Does the community require a meeting place? Does the community or neighborhood impacted have specific social desires that may affect construction? With new construction, these community desires can be identified in the planning phase and built-in to the original design. Overall, in terms of value as it is defined by community perception, new construction has the most value of any of the options identified because of it’s adaptability in the planning and design phase. Modular construction will have some adaptability to the needs of the community, however, the use of prefabricated elements will produce some expected restrictions to modification. The renovation of a currently vacant warehouse will most likely produce a positive perception of value by the neighborhoods impacted through the concept of urban redevelopment. The public may also have a very positive view of fiscal responsibility for the purchase of an existing property versus building a new facility. In terms of public use, renovation projects are very restricted in the placement and design of meeting rooms and public access.

The concept of Affordability can be discussed by reviewing Initial cost in relation to existing Capitol Funds, Recurrent Costs in relation to annual budget

and Economic Trends that impact the decision-making process. The most asked question from elected officials is usually: “How are we going to afford this project?” New and modular construction requires some money in year one (as shown in the cost comparison appendix), but the true expense is the long-term commitment to the recurrent costs. Even though it may be proven that planning, designing and constructing a quality building may indeed save money over 30 years or more, economic factors may influence the willingness to commit to a long- term financial obligation. Inflation, recession, bonds rates and other important financial indicators of the national economy all greatly affect the localities and their ability to borrow money (Colvin, 2002). Renovation projects may be the only option available due to poor bond ratings causing higher interest rates or the timing of the issue. According to Colvin, if a City has recently leveraged several million dollars for Capital Projects, they may not want, or be able to leverage any additional debt regardless of the need for public safety.

“Currently, in May of 2002, the City of Staunton is not in a position to borrow the necessary funds for constructing any new facilities” (Stripling, 2002). Stripling also stated that with the economy in an active Recession, tourism numbers down, economic development showing no active growth and the City’s financial well-being at risk, the Fire Department will most likely have only the existing surplus balance funds to draw on for this project.

Many of the advantages and disadvantages that can be identified to compare and contrast the selected options are listed in the appendix (labeled respectively). The major differences between the options are: time of project

completion, funding needed, service life of the buildings, funding available. New construction has all the advantages in design and planning but disadvantages in time of project completion and funding required. Modular costs less to build and can be constructed in a shorter length of time, but has some limitations on design and quality. Renovation efforts will produce a facility quickly, capitalizing on public opinion and has a quality of adaptive reuse (it can be reused for what it was originally designed for if the fire department sells and vacates). Renovations large disadvantages are realized in recurrent maintenance costs and short life expectancy remaining in the building itself.

Discussion

The study results in relation to what others have published are really not applicable to any great degree. There are many examples of recent new construction available in the trade journals providing examples, overviews and associated costs (Career, 2002). What these sources do not address are any guidelines on how to present this option to an elected body in comparison to alternative construction methods. In calculating actual costs, I found this to be not only area specific, but formulas are made available for many cities and towns that can be of great assistance to a project manager when estimating all relative costs (Marshall and Swift, 2002).

Modular construction is used throughout the nation for building fire stations but is not written about. The most recent documents available in the LRC were dated prior to 1980 (Fire Chief, 1979). I did not have to travel far away

from this jurisdiction to find 3 of the 6 closest volunteer companies utilizing modular construction. Type-S construction (modular) is accessible and obviously utilized, but pertinent documentation outlining the advantages and disadvantages are just not available. No recent articles or text could be located in referencing this specific construction methodology.

Renovation efforts for buildings already used as a fire station were also very readily available through the LRC and the internet (Renovation, 2002). Fire Chief Magazine online documented a series of award-winning projects that outlined this type of renovation in-depth in it's StationStyle section. Unfortunately, this was not the information that was needed to complete this study. The City of Staunton was interested in buildings that already exist in the community, (not currently used as a fire station), that could be renovated to make a fully functional fire station facility. The search for information was focused on finding research that recommended one type of use group over another (e.g. restaurants vs. gas stations, or retail spaces vs. warehouses). This information also was not available through any of the standard research methods.

This authors interpretation of the study results notes that from a political sense, renovation will be the avenue of choice for the elected officials. When looking closely from a financial cost analysis, new construction has too many advantages to consider employing the other options. The initial and recurrent costs are only marginally different between new construction and modular making it a much better long- term investment. As with most municipal organizations, it is realized that what may make the most sense in a long-term

arrangement, (in relation to fiscal responsibility to the taxpayers), may not be what is ultimately desired and voted upon for approval due to the political and economic influences.

Locally, management and the elected officials have decided not to encumber any large debt in the next 3-5 years due to the economy, leaving a renovation project possibly the only option available regardless of long-term costs (Stripling, 2002). At this point in time, the City of Staunton faces the reality of waiting 3-5 years on large Capital Projects to avoid incurring any additional debt. The fire department faces the reality of recommending a renovation project today and having it potentially funded versus waiting 3-5 years for another financial review to analyze the ability to build a new, modern facility. This recommendation fully recognizes the long-term financial impact of the listed options and will need to take into account the immediate service needs of the public as justified in the original scope and purpose of this study.

Recommendations

There are definite advantages to building a new fire station as soon as our City can afford to do so. The elected officials are encouraged to carefully analyze the short-term and long-term financial impacts of the project. Modular construction does not realize a significant advantage over the other options studied and should be eliminated from further consideration. The options left should ultimately be decided by how much debt the City is comfortable in committing too, when looking at all the financial data available. If the City

decision-makers are comfortable in accepting and extending their present debt-load, then new construction is the best option. If no more debt is the prevailing decision, then renovating a current building with existing surplus funds appears to be the only solution.

The problem addressed in this study was that no information existed to identify the options available for either buying a current structure and renovating or building a structure to use as a fire station. The purpose of this study was to provide this information so that financial decisions could be determined in facility acquisition. This study contains enough descriptive information for the reader to understand what is available and outlines the financial costs, both short and long-term. Many other advantages and disadvantages are discussed to inform and guide the reader to understanding the total impact of one option as compared to the others in the two provided appendixes.

Future readers are encouraged to begin any similar process in their own jurisdiction by starting with the determination of what the municipality can afford before any recommendations are brought before an elected body. This study relied heavily on information obtained through interviews with department heads and local officials, which were very helpful in determining costs and options. Future readers are also encouraged to write about buildings utilizing a modular construction method if they have personal experiences (as the information base is currently poor). No information is available in written form that analyzes the conversion and renovation of buildings for use as a fire station that were originally designed for some other type of use. This would make an excellent

EFO paper and assist Fire Chiefs throughout the country in adding another option in facility acquisition.

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Appendix A: Comparison for Costs, Value and Affordability

	New Construction (8000 sq.ft.)	Modular (8000 sq.ft.)	Renovation (7700 sq.ft.)
Costs			
Initial Cost (Year-1)	$105,944	$71,224	$410,000
Recurrent Cost (2-10) (Debt +Maintenance & Utilities)	$105,022.56 annually	$ 90,032 annually	$ 57,600 annually
Total Cost (Year 1-10) (Initial + Recurrent Cost)	$1,156,170	$990,357	$986,000
Total Cost (Year 1-20) (Initial + Recurrent Cost)	$2,206,395	$1,871,874	$1,562,000
Facility Life Expectancy (Service Life left after 20 yrs.))	25 remaining (45 initial)	15 remaining (35 initial)	-0- remaining (20 initial)
Facility Worth (in Dollars) (Depreciation % at 20 yrs. based on original purchase price)	$815,769 (23%)	$434,466 (39%)	$32,550 (79%)
Value			
Total Expected Service Life of Building (realistic)	60	40	20
Satisfies NFPA 1201 (Response objectives)	YES	YES	YES
OSHA Compliant	YES	YES	NO
Community Satisfaction (Civic and Social needs)	YES	YES	NO
Affordability			
Initial Cost (Year-1) within budget CIP capabilities	$105,944 (YES)	$71,224 (YES)	$410,000 (YES)
Recurrent Cost (2-10) (Debt +Maintenance & Utilities) within budget capabilities	$105,022,56 annually (NO)	$90,032 annually (NO)	$57,600 annually (YES)
Economic Trends Identified Economic Development National Recession Local Economy	Stable (No Growth)	Stable (No Growth)	Stable (No Growth)

Appendix B- Advantages / Disadvantages of the selected facility types

	New Construction (8000 sq.ft.)	Modular (8000 sq.ft.)	Renovation (7700 sq.ft.)
Advantages	No remediation needs (HAZMAT) Fully functional Code Compliant Modern Technology Few repair issues in first 20 years Architecturally designed to fit in neighborhood Low maintenance Long term investment	No remediation needs (HAZMAT) Moderately Functional Code Compliant Good Technology Minor repair issues in first 20 years Low maintenance Least expensive new construction	Acquisition less resource intensive Immediate occupancy Adaptive Reuse Lower initial Cost Short-term investment Public Relations potential for reuse of current facility
Disadvantages	Land Acquisition Availability of utilities Time of project Approval process (Planning/Zoning) Site preparation Total project cost	Limited Design options Approval Process Time of Project (but less than traditional construction) Site preparation Building Life expectancy	Hidden/Unknown repairs/ deficiencies Possible HAZMAT mitigation needed Lifespan of Building short Functional Obsolescence Not practical for long-term investment